Gender diversity and the spillover effects of women on boards

Received: 2 October 2019 | Revised: 6 August 2020 | Accepted: 10 August 2020

DOI: 10.1111/corg.12339

WILEY

ORIGINAL ARTICLE

Gender diversity and the spillover effects of women on boards

Maria Boutchkova | Angelica Gonzalez | Brian G.M. Main | Vathunyoo Sila

The University of Edinburgh Business School, Edinburgh, UK

Correspondence
Angelica Gonzalez, The University of Edinburgh Business School, Edinburgh, UK.
Email: angelica.gonzalez@ed.ac.uk

Abstract

Research Question/Issue: This study seeks to understand the circumstances under which board behavior is affected by gender diversity. The "reasoned action approach" is used as a lens through which to assess the extent that the behavior of the board varies with its gender diversity.

Research Findings/Insights: The study uses archival data from a panel sample of 80,395 directorships observed between 1998 and 2012. Boardroom gender diversity is significantly related to director personal responsibility (board attendance), CEO accountability, and risk taking. Our findings highlight the key importance of the exposure of male directors to women directors on boards beyond the focal board. This suggests a positive externality or a spillover effect.

Theoretical/Academic Implications: The empirical findings of this study highlight the importance of allowing for the operation of social norms when studying boardroom decision making. Experience gained by male directors of working with women directors on other boards, beyond the focal board, is shown to enable women directors to contribute more effectively.

Practitioner/Policy Implications: This study offers encouragement to policy makers' intent on increasing the presence of women on corporate boards. These results point to a spillover effect: there is an observed impact of women on boards that acts not only directly on the board on which they sit but also through the network of boards on which their male counterparts sit.

Video Abstract: https://youtu.be/ZlADhUUdZrA

KEYWORDS

Corporate governance, board of directors, gender diversity, reasoned action approach

1 | INTRODUCTION

There have been calls (Adams, de Haan, Terjesen, & van Ees, 2015; Hoobler, Masterson, Nkomo, & Michel, 2018; Kumar & Zattoni, 2016) for more research on the characteristics of female directors and the contributions they make to company performance. The interest in evaluating the impact of women on boards is driven not only by an increased awareness of the importance of diversity and inclusion (Bartlett & Preston, 2000) but also from a practical desire to improve corporate governance systems that have all too often come up wanting. Whether stemming from the excessive risk taking that surrounded the financial crisis (e.g., Anglo Irish, AIG, RBS, and Lehman Brothers), insufficient accounting oversight (e.g., Enron, Olympus, Parmalat, and Toshiba), poor operational control (e.g., Siemens, Volkswagen, and

Wells Fargo), or straightforward corrupt practices (e.g., Petrobras and Samsung), recent experience adds up to a far from perfect record.

In some cases—and the Lehman Brothers company name only serves to highlight the issue (Adams & Ragunathan, 2017)—the question has been asked whether things might have turned out for the better had there been more women on the board.

The importance of corporate governance is well recognized (Bebchuk, Cohen, & Ferrell, 2009; Shleifer & Vishny, 1997). The board of directors plays a key role in corporate governance (Adams, Hermalin, & Weisbach, 2010), and in recent years, the role of female directors has received particular attention (Adams et al., 2015; Adams & Ferreira, 2009; Terjesen, Sealy, & Singh, 2009). Although a gender-diverse board could be expected to improve board decision making and hence firm performance (Kumar & Zattoni, 2016), the empirical evidence has remained inconclusive (Ferreira, 2015; Larcker, Richardson, & Tuna, 2007). This paper approaches the question through the lens of the reasoned action approach[1] (Fishbein & Ajzen, 2010), which affords a key role to social norms in the formation of the attitudes and intentions that determine board behavior. We argue that the extent to which these social norms (in terms of what is right under various circumstances) are influenced by the presence of women on the board will depend on the extent to which they are taken seriously and allowed to contribute effectively to shaping the board's norms, attitudes, and intentions.

The gender diversity of the board clearly has the potential to impact on the social norms of the board (Beaman, Chattopadhyay, Duflo, Pande, & Topalova, 2009; Terry, Hogg, & White, 1999; Van Vugt & Iredale, 2013). The novelty of our research is that we allow for experience of gender diversity on other boards to affect the extent to which gender diversity impacts on social norms—and hence behavior—of the focal board. This spillover effect is hypothesized as arising through some of the male directors on the focal board also having experience of working alongside women on other boards. This effect forms a central part of the paper. The impact of gender diversity on board behavior is measured in terms of outcomes such as the record of board meeting attendance by individual directors, the performance sensitivity of CEO separations, and the risk profile of the board's investment decisions.

The role of the spillover effect in enhancing the effective impact of women on the board is attributed to the enhanced legitimacy that they are accorded by male colleagues who have experience of working alongside female directors on other boards. The issue of individual women directors being taken seriously is highlighted in Harrison, Price, and Bell (1998), who drew a distinction between surface-level gender diversity and deep-level gender diversity. The productive potential of deep-level diversity is undermined by social categorization processes that inhibit the effective operation of the board. The development of gender-based fault-lines within the board (Lau & Murningham, 1998; Li & Hambrick, 2005) can inhibit the contribution of female directors to social norms and effective board decision making (Kaczmarek, Kimino, & Pye, 2012). The origin of these gender-based fault lines may lie in a form of gender stereotyping best summarized by the "think manager, think male" aphorism (Schein, 1975; Schein, Mueller, Lituchy, & Liu, 1996). This explanation of the bias against women in senior positions has been further developed by Eagly and Karau (2002) as role congruity theory. Such biased perceptions can lead to a "reactive devaluation" (Ross & Stillinger, 1991), whereby the contributions of women in senior positions are not taken as seriously as they merit.

Because female directors are found to be associated with better monitoring behaviors (Adams & Ferreira, 2009; Adams & Ragunathan, 2017; Huse, Nielsen, & Hagen, 2009), we first consider attendance at board meetings as an observable outcome that relates to a director's attitude toward monitoring and examine the difference in this behavior among *individual* male directors who work alongside women. We find that male directors who work alongside female directors on other boards ("externally connected men") are associated with better board meeting attendance in the presence of female directors on the focal board. Our results suggest that the presence of women on other boards has a "spillover effect" on men's susceptibility to influence by the social norms of female directors, in terms of attendance.

We further find that on boards with female directors, the proportion of externally connected men (i.e., working alongside women on other boards) is positively associated with the performance sensitivity of CEO turnover, a commonly used measure of CEO accountability. Overall, we find that the presence of female directors on a board alongside externally connected male directors is associated with resource allocation decisions that result in lower firm risk. This analysis is conducted using data on 80,395 directorships in the United States between 1998 and 2012.

The study contributes to the existing literature in the following two ways. First, it documents a spillover effect in terms of how effectively female directors influence the social norms and behaviors of the board. This spillover effect arises from male directors being in contact with female directors across different boards. The difference in outcomes is seen in terms of personal responsibility as manifested in board attendance (Adams & Ferreira, 2009), accountability regarding the sensitivity of CEO departures to performance (Chen, Cumming, Hou, & Lee, 2016; Lucas-Perez, Mınguez-Vera, Baixauli-Soler, Martin-Ugedo, & Sanchez-Marin, 2015), and the risk profile of the board's resource allocation decisions (Mateos de Cabo, Gimeno, & Nieto, 2012).

Second, we contribute to the literature that documents the business case for gender diversity. In recent years, many countries have set targets or quotas aimed at improving what had previously been an underrepresentation of women in the boardroom (Isidro & Sobral, 2015; Marquardt & Wiedman, 2016; Seierstad, Warner-Sderholm, Torchia, & Huse, 2017; Terjesen, Aguilera, & Lorenz, 2015). These decisions were often accompanied by supporting arguments that alluded to the improved business performance of companies with more diverse boards (Bear, Rahman, & Post, 2010; Campbell & Minguez-Vera, 2008; Ellwood & Garcia-Lacalle, 2015; Francoeur, Labelle, & Sinclair-Desgagn, 2008). We strengthen such business case arguments by providing evidence of a positive externality or spillover effect arising from the presence of women in the boardroom, which presents in the form of male directors being more responsive to the

presence of women on the board if they also serve alongside women on other boards. In this way, the increased presence of women on boards promises to deliver a nonlinear impact on board behavior—not only through the focal board on which they serve but also acting through the board networks of male directors to validate the presence of women directors in other companies. Expanded experience of working with women directors on boards facilitates a "normative legitimacy of gender diversity" (Zhang, 2020, p. 442) and helps extend beyond a superficial level of diversity toward a deep level of diversity (Harrison et al., 1998).

2 | LITERATURE AND HYPOTHESES

2.1 | Influences of female directors

A key consideration regarding the effective influence of female directors and the extent to which they are taken seriously emerges in the work of Harrison et al. (1998), who warned of the difficulties of going beyond a surface-level diversity and attaining a truly effective deep-level diversity. The potential of deep-level diversity can be thwarted by social categorization processes. In terms of the board, gender-based fault lines (Lau & Murningham, 1998; Li & Hambrick, 2005) can constrain effective board decision making (Kaczmarek et al., 2012). Perceived tokenism, as outlined by Kanter (1977), is one example of this effect. This is akin to correspondence bias (Gawronski, 2004), except that instead of a person's actions being incorrectly attributed to their disposition, the gender of the director is being incorrectly regarded as an indicator of inappropriate fit. Fellow (male) directors perceive a causal model that links a female director's minority (token) position to the validity of her views. This leads them to discount the presence, influence, and contribution of these female directors. This is part of a more general phenomenon where women in senior positions are regarded with the suspicion that they are not quite right for the role. This "role congruity" bias (Eagly & Karau, 2002) is captured in Schein's "think manager, think male" aphorism (Schein et al., 1996), whereby characteristics associated with being male align with those that people associate with a manager but no so in the case of being female. Such gender stereotyping (Gupta, Wieland, & Turban, 2019; Schneider, Iseke, & Pull, 2019) leads to biases that manifest in the contributions of female directors being discounted or subject to reactive devaluation, solely owing to their gender (Ross & Stillinger, 1991). Female directors consequently find it difficult to be effective in influencing the prevailing social norms of the board and hence the board's decisions: they are not given a hearing.

Empirical evidence continues to accumulate in support of the view that women in senior positions are at a disadvantage in the labor market when they fail to fit the stereotype (male-oriented) characteristics of a manager. For example, Gupta et al. (2019) found that high-growth and profit-maximizing entrepreneurs are perceived to possess characteristics typical of men, consistent with the "think manager, think male" aphorism. Schneider et al. (2019) showed, in a cross-country setting, that female executives are paid less than male executives, with the differences more pronounced among external executive candidates. These authors argue that, despite female executives being in high demand, women are paid less because of stereotyping against female executives. Main and Gregory-Smith (2018) found that female directors are more likely to have shorter directorship careers than men. They are more likely to exit the board once the firm is unable to count them as independent directors (after 9 years). Once the cloak of independence falls away, female directors are no longer treated in the same way as their male counterparts.

As highlighted by Terjesen et al. (2009), social norms acting through social identity (Kanter, 1977; Westphal & Milton, 2000) can influence the extent to which women's voices are heard. This then affects the board's attitudes, intentions, and consequent behavior. Social cohesion (Westphal & Zajac, 1995) can also produce social norms on the board in regard to how women are heard. To help organize our thinking in this context, we adapt Ajzen's (1991) theory of planned behavior (Figure 1), now generally known as the "reasoned action approach" (Fishbein & Ajzen, 2010). The origin of this model (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) lies in explaining intentions to act as being the outcome of both attitudes (beliefs regarding the benefits and costs of an action) and social norms (perceptions of what should be the course of action with which significant others would expect one to comply). A later modification by Ajzen (1988, 1991) added a further consideration, namely, perceived behavioral control—the extent to which the outcome was within the power of an individual to determine.

In the context of our study, we are treating the board, not the individual, as the entity. The board's social norms (reflecting perceptions of how significant others would behave) influence the extent to which female board members are taken seriously and allowed to have a say, as opposed to being regarded merely as symbolic additions to the board (Pfeffer, 1982). The extent to which female directors are able to be effective will, in turn, influence the board's social norms and hence its attitudes and intentions regarding behavior (e.g., as to the importance of attending board meetings). Both directly and indirectly, via the board's attitudes, social norms impact on the board's intentions regarding its decisions. As a result, it is not only personal behavior such as board meeting attendance but also group (board) outcomes such as the willingness to replace an underperforming CEO, or the riskiness of the firm's resource allocation behavior, that are affected. There is a simultaneity here, with the social norms of the board both determining the effectiveness of female directors on the board and those very social norms reflecting the (effective) contributions of female directors.

This paper investigates whether exposure of male directors to working alongside female directors on other boards undermines the role congruity bias (Eagly & Karau, 2002). Arguably, it becomes more difficult for a male director to discount the contributions and behavior of a female director when he sees female directors contributing in other external situations (Alexander, 2012; Beaman et al., 2009; Heilman, 2001). Echoing Sheridan and Milgate (2005), who pointed to the importance for senior women of high visibility, it is then more

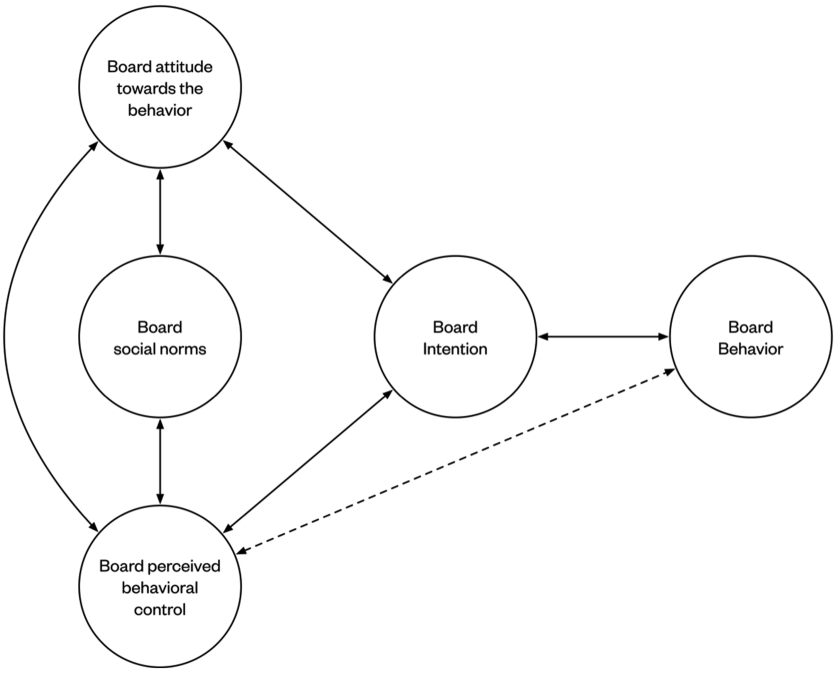

FIGURE 1 Board behavior and the reasoned action approach. This figure is adapted from the original version in Azjen (1991)

difficult to simply attribute positive outcomes to circumstances other than the contribution of the female director, making it more likely that women directors will be treated by these men as individuals in their own right—not merely a situational feature.

The research question being considered in this paper is whether the experience of working alongside women directors on more than one board leads to a reduction in any such bias. This then allows the contributions of women directors to be given more weight in boardroom deliberations, thereby enhancing their influence on the focal board (Beaman et al., 2009; Heilman, 2001). This influence can be expected to manifest in a board's social norms and attitudes to behavior (see Figure 1). In the empirical estimates that follow, we are limited to the reduced form of this model and, at this stage, are unable to disentangle the various stages in Ajzen's (1991) model. The model remains, nevertheless, a useful organizing framework for our approach.

We call the effect of working alongside women on boards other than the focal board a spillover effect (Dimant, 2015; Wheeler, 1966). In our analysis of the impact of boardroom gender diversity, a special effort will be made to allow for the influence of the presence of female directors on male directors—both those encountered on the focal board ("internal connection") and those on any additional boards on which the male director serves ("external connection"). Thus, both "internal connections" and "external connections" of male directors to female directors will be measured.

2.2 | Female influence and attendance behavior

The literature documents differences in behaviors and attitudes between male and female directors (see Croson & Gneezy, 2009, for an excellent literature review on gender differences in the general population). Adams and Funk (2012) survey core values and attitudes of directors and CEOs in Sweden and find that the women in their sample are more benevolent, more universally concerned, and less power oriented than men. These women are also found to be slightly less tradition oriented and less risk averse. Evidence shows that female directors are perceived to be more serious about their directorships and more conscientious at board meetings (Huse & Solberg, 2006; Izraeli, 2000; Kaplan, Pany, Samuels, & Zhang, 2009). Empirical evidence also suggests that they are better at monitoring than their male counterparts (Adams & Ferreira, 2009; Adams & Ragunathan, 2017). We argue that female directors can influence male directors through establishing a social norm of more conscientious behavior. We consider "conscientiousness" as a behavioral style of female directors and investigate whether male directors change their related behaviors when exposed to the influence of female directors.

Guerrero, Lapalme, Herrbach, and Séguin (2017) defined conscientiousness as "an individual's propensity to be dependable and to strive for achievement." Although we have no direct method to measure a director's conscientiousness, we have a way to gauge their dependability through the flag for board meeting attendance problems as reported in each firm's annual SEC proxy statement. Board meetings provide the opportunity for directors to evaluate the performance of the executive team, and the information obtained from these meetings is crucial for the board's monitoring and advising responsibilities to the company. At the same time, each director incurs individual opportunity cost of time in order to attend board meetings, because most directors have other high-level jobs and activities to which they could instead devote their time. Therefore, the decision to attend a board meeting could reflect the director's dedication to the firm in relation to their other responsibilities (Adams & Ferreira, 2009). In a similar vein, several studies use director meeting attendance as an indication of the extent to which individual directors exert effort in their role at the firm (Cai, Garner, & Walkling, 2009;

Ferris, Jagannathan, & Pritchard, 2003; Li & Srinivasan, 2011). Therefore, director attendance at board meetings represents a rare granular outcome that allows an individual's attitude toward their role in the boardroom to be assessed.

This is the line taken by Adams and Ferreira (2009), who found that female directors are less prone to attendance problems and interpret this as evidence of female directors being better monitors of the CEO. These authors also find that fewer male directors exhibit attendance problems when there is a female presence in the boardroom. Their results support our narrative that women directors have some influence over the majority group, that is, male directors. The evidence from Adams and Ferreira (2009) suggests an "internal influence" where both male and female directors sit on the same board. However, as explained above, we also seek to test the spillover effect of any influence on the social norms of the board through the contact its male directors have with female directors on any other boards on which these male directors serve—namely, an "external influence." Allowing for such a spillover effect leads us to our first hypothesis as follows:

Hypothesis 1. Male directors are less likely to exhibit attendance problems when they are on a gender-diversified board and are externally connected with female directors.

2.3 | Female influences and firm-level outcomes

The literature in the areas of economics, ethics, and organizational behavior documents evidence that women can behave differently from men. Specifically, the evidence suggests that women tend to be more risk averse, are less likely to be overconfident, and exhibit more independent thinking (Agnew, Balduzzi, & Sundén, 2003; Barber & Odean, 2001; Beyer, 1990; Gneezy, Niederle, & Rustichini, 2003; Lundeberg, Fox, & Punćcohaŕ, 1994). Women are also more ethical and are better at promoting deliberation and communication (Albaum & Peterson, 2006; Larkin, 2000). These traits suggest that women are better suited to monitoring roles than men.

Recent research also provides some evidence that female directors are tougher monitors of the CEO. Adams and Ferreira (2009) found that female directors are less likely to miss board meetings, are more likely to hold positions on monitoring committees, and that the presence of female directors increases the likelihood of forced CEO departures after poor stock price performance. Gul, Srinidhi, and Ng (2011) found that female directors improve firm transparency by increasing public disclosure of corporate information. Prior research also documents evidence that the presence of female directors is associated with greater quality and accuracy of financial accounting information (Clatworthy & Peel, 2013; Srinidhi, Gul, & Tsui, 2011).

Although it is potentially more difficult for female directors to directly impact firm-level outcomes because of their minority or token status (Farrell & Hersch, 2005; Gregory-Smith, Main, & O'Reilly, 2014; Kanter, 1977; Tinsley, Wade, Main, & O'Reilly, 2017), it is possible that they can have an indirect but no less substantive effect through their influence on the behavior of male directors. As discussed above, the reasoned action approach (Ajzen, 1988, 1991; Fishbein & Ajzen, 2010) suggests that the intentions that drive action are an outcome of social norms, attitudes, and perceived behavioral control. Contact with female directors can affect the behavior of male directors through any one of these channels—social norms being the most obvious. If so, the female influence on the board's social norms may not depend simply on those female members on the focal board (internal influence) but also on any female directors that the male directors have encountered in the course of their other directorships (external influence). This is particularly true if such external contacts reduce the inherent biases that otherwise undermine the effective contributions of women directors (Eagly & Karau, 2002; Schein, 1975).

One of the key responsibilities of the board is to monitor the CEO (Hermalin & Weisbach, 2003; Mace, 1971). CEO turnover, particularly when the firm performs badly, can be treated as an observable outcome of the monitoring activity of the board. For example, Weisbach (1988) found that CEO turnover is more sensitive to performance in an outsider-dominated board. CEO turnover also tends to be more sensitive to performance in firms with a smaller board (Yermack, 1996) and when the chair's position is separate from the CEO position (Goyal & Park, 2002). Adams and Ferreira (2009) found that the presence of female directors increases the likelihood of forced CEO departures after poor stock price performance. This suggests a positive relationship between effective monitoring and CEO accountability (turnover sensitivity).

Similar to board attendance, we anticipate a spillover effect whereby CEO turnover is more sensitive to performance when there are both internal and external influences of female directors. Therefore, we hypothesize the following:

Hypothesis 2. In the face of poor firm performance, the probability of CEO turnover increases on gender-diversified boards where male directors are externally connected with female directors.

Next, we examine the relationship between connected male directors and risk taking. Sah and Stiglitz (1986, 1991) argued that centralized decision making can lead to either very good or very poor outcomes. Thus, without checks and balances, firms might be managed in ways that result in extreme performance outcomes; that is, firms can become riskier. Although there is evidence that the presence of female directors is associated with better monitoring (Adams & Ferreira, 2009; Clatworthy & Peel, 2013; Gul et al., 2011) and that monitoring of the CEO is associated with lower risk (Adams, Almeida, & Ferreira, 2005; Li & Tang, 2010; Minton, Taillard, & Williamson, 2014), recent works fail to find evidence that the presence of female directors are associated with the reduction in a firm's risk (Adams & Ragunathan, 2017; Sila, Gonzalez, & Hagendorff, 2016).

To allow for the possible influence of women directors, we postulate that the presence of female-connected male directors can decrease firm risk taking and potentially more so where male directors are both internally and externally connected with female directors. This leads to our final hypotheses:

Hypothesis 3a. Equity risk measures decrease on gender-diversified boards.

Hypothesis 3b. Equity risk measures decrease on gender-diversified boards where male directors are externally connected with female directors.

3 | SAMPLE AND METHODOLOGY

For this study, we obtain an unbalanced panel of director-level data for Standard & Poor's (S&P) 500, S&P MidCaps, and S&P SmallCap firms for the period 1998–2012. The sample consists of 80,395 directorships (director-firm-years) held by 13,451 directors across 1886 firms. When we consolidate the director data into firm-level variables, our final sample comprises 15,982 observations (Table 1).

3.1 | Directorship-level data

In Panel A of Table 2, we present summary statistics of the characteristics of all the directorships in our sample. Out of 80,395 directorships, 10,719 are held by women (13.3%) and 69,676 (86.7%) by men. To determine whether a male director is externally connected, we investigate each male director in each firm year. If, in a particular year, a male director sits on at least one other board that has female directors, he is considered to be externally connected with women. Out of the male directorships in our sample, 22,684 are externally connected (about 32.6% of the full male sample). Summary statistics of the characteristics of male directors with and without external connections and the firms where they sit are reported in Panel B of Table 2.

According to Panel A, an average director is about 62 years old and has an average tenure of 9 years. The variable *# Other Directorships* can be a proxy for director "busyness"—directors having many

TABLE 1 Variable definitions

Panel A: Director-level variables	
D (Male Director)	=1 if the director is a man, and 0 if the director is a woman
D (Connected with Women)	=1 if the male director sits on the same board as at least one woman in his other directorships, and 0 otherwise
D (Not Connected with Women)	=1 if the male director does not know any female director from his other directorships, and 0 otherwise
Director Age	Director's age (years)
Director Tenure	The number of years that the director has been on the board of directors
Other Board Appointments	Number of other directorships held by the director
Absenteeism	=1 if the proxy statement reports that the director misses more than 75% of board meetings, and 0 otherwise
Panel B: Firm-level variables	
Proportion of Men Externally Connected with Women	The number of male directors who sit on the same board as at least one woman in his other directorships divided by the total number of directors
Proportion of Women	The number of female directors divided by the total number of directors
Average Director Age	The average age of all directors
Average Director Tenure	The average tenure of all directors
# Other Directorships	The total number of other directorships held by all directors
Board Size	The total number of directors
Proportion of Independent Directors	The number of directors who are non-executives and do not have any other affiliation with the managers divided by the total number of directors
Log (Total Assets)	Natural logarithm of total assets
Tobin's *Q*	Stock price at fiscal year end times the number of common shares outstanding divided by the book value of equity
ROA	Return on assets, defined as net income divided by total assets
R&D Expenditures	Research and development expenditures divided by total assets. Missing values are replaced by zero
Capital Expenditures	Capital expenditures divided by total assets. Missing values are replaced by zero
Leverage	Total long-term debt divided by total assets
Total Risk	Natural logarithm of daily stock price volatility multiplied by the square root of 250
Systematic Risk	The regression coefficient for market returns (using CRSP value-weighted index) from the single-factor market model
Idiosyncratic Risk	Natural logarithm of the residuals from the single-factor market model multiplied by the square root of 250
Diversification	The Herfindahl–Hirschman Index for sales concentration across business segments.
Stock Performance	Average daily stock return
CEO Chair Duality	=1 if the CEO is also the chairman of the board, and 0 otherwise

TABLE 2 Summary statistics (directorship-years)

Panel A: All directors, male directors, and female directors

	All directors				Male directors				Female directors			
	Mean (1)	StDev (2)	Min (3)	Max (4)	Mean (5)	StDev (6)	Min (7)	Max (8)	Mean (9)	StDev (10)	Min (11)	Max (12)
Age	61.85	8.21	28.00	98.00	62.54	8.14	28.00	98.00	57.38	7.25	31.00	83.00
Tenure	8.95	6.53	0.00	59.00	9.17	6.71	0.00	59.00	7.56	5.02	0.00	34.00
Other Directorships	0.63	0.95	0.00	9.00	0.61	0.93	0.00	9.00	0.75	1.06	0.00	7.00
Attendance Problem	0.01	0.12	0.00	1.00	0.01	0.12	0.00	1.00	0.01	0.11	0.00	1.00
Board Size	9.46	2.24	3.00	23.00	9.38	2.25	3.00	23.00	10.00	2.13	4.00	23.00
% Independent Directors	0.76	0.13	0.10	1.00	0.76	0.14	0.10	1.00	0.77	0.13	0.17	1.00
Total Assets ($ billions)	8.36	22.10	0.02	334.00	7.89	21.30	0.02	334.00	11.40	26.60	0.03	331.00
Tobin's Q	1.95	1.36	0.40	78.56	1.95	1.36	0.40	78.56	1.96	1.31	0.53	39.12
ROA	0.05	0.14	−5.88	0.78	0.04	0.14	−5.88	0.78	0.05	0.09	−1.66	0.60
Total Risk	0.43	0.20	0.10	2.23	0.43	0.20	0.10	2.23	0.40	0.19	0.10	1.71
R&D Expenditure	0.07	1.53	0.00	237.86	0.07	1.64	0.00	237.86	0.04	0.16	0.00	8.03
Capital Expenditure	0.08	1.44	−0.90	233.99	0.08	1.55	−0.90	233.99	0.05	0.09	−0.68	2.31
Leverage	0.22	0.17	0.00	1.87	0.22	0.17	0.00	1.87	0.23	0.16	0.00	1.87
Observations	80,395	80,395	80,395	80,395	69,676	69,676	69,676	69,676	10,719	10,719	10,719	10,719

Panel B: Male directors with and without external connection to female directors

	Male directors without external connection				Male directors with external connection			
	Mean (1)	StDev (2)	Min (3)	Max (4)	Mean (5)	StDev (6)	Min (7)	Max (8)
Age	62.36	8.73	28.00	98.00	62.91	6.74	32.00	95.00
Tenure	9.56	7.09	0.00	59.00	8.35	5.75	0.00	45.00
Other Directorships	0.11	0.35	0.00	4.00	1.64	0.90	1.00	9.00
Attendance Problem	0.014	0.12	0.00	1.00	0.015	0.12	0.00	1.00
Board Size	9.05	2.18	3.00	23.00	10.05	2.23	4.00	23.00
% Independent Directors	0.74	0.14	0.10	1.00	0.78	0.13	0.10	1.00
Total Assets ($ billions)	5.45	15.60	0.02	334.00	13.00	29.20	0.02	334.00
Tobin's Q	1.96	1.42	0.40	78.56	1.94	1.24	0.41	39.12
ROA	0.04	0.15	−5.88	0.78	0.05	0.12	−5.88	0.78
Total Risk	0.45	0.21	0.10	2.23	0.40	0.19	0.10	1.85
R&D Expenditure	0.08	1.65	0.00	237.86	0.06	1.62	0.00	237.86
Capital Expenditure	0.09	1.54	−0.90	233.99	0.07	1.56	−0.90	233.99
Leverage	0.21	0.18	0.00	1.87	0.24	0.17	0.00	1.62
Observations	46,992	46,992	46,992	46,992	22,684	22,684	22,684	22,684

Note: The sample covers the period between 1998 and 2012. Columns 1–4 of Panel A present summary statistics for all directorship-years in the sample. Columns 5–8 (columns 9–12) present summary statistics for the male (female) subsample. Panel B divides male directorship-years into two subsamples. Columns 1–4 present summary statistics for male directors without any external connection to female directors. Columns 5–8 present summary statistics for male directors with at least one external connection to female directors. Descriptions of all variables are in Table 1. Directors' information is from the RiskMetrics database. Accounting variables are obtained from the Compustat database. Total Risk is calculated using price data from the Center for Research in Security Prices.

outside directorships may have limited ability to monitor (Fich & Shivdasani, 2007). It can also be seen as a signal of director ability in that sitting on multiple boards might indicate that his human capital is in high demand (Masulis & Mobbs, 2014). On average, a director holds 0.63 external directorships. According to the Securities and Exchange Act of 1934, firms are required to disclose in their proxy statement any director whose attendance is below the 75% threshold. Therefore, we compute the variable *Attendance Problem* as a dummy

variable that equals one when directors attend fewer than 75% of the sum of the total number of board meetings and the total number of meetings held by board committees on which they serve in each year. Only 1.4% of the directorship-years in the sample are reported as exhibiting attendance problems. This is not surprising given that directors who have attendance problems are reported in the proxy statement and that this could be detrimental to their reputation.

The other columns of Panel A reveal that female directors are younger and have shorter tenure than their male counterparts. The average age of female directors is about 57.38 years, as compared with 62.54 years for male directors. An average female director has spent 7.56 years on the focal board, whereas the average tenure is 9.17 years for male directors. These differences in age and tenure are significant at the 1% level. The level of attendance problems is higher among male directors than among female directors (significant at the 5% level). Women, on average, sit on larger and more independent boards. They also sit on boards of larger firms with higher growth opportunities.

Panel B of Table 2 shows that among male directors, those who are externally connected with female directors are slightly older and have shorter tenure. Because the number of external board directorships is larger for externally connected men, we investigate the possibility that our results are confounded by the number of male directors in the robustness tests included in the Online Appendix. Male directors who have external board connections to female directors also sit on larger and more independent boards in larger firms. The firms where the externally connected men work are more profitable and have lower risk and higher leverage. Consequently, all these characteristics are included in the model, because not accounting for such differences may cause the results to be biased.

3.2 | Firm-level data

We consolidate the directorship-level observations into firm-level data and present the summary statistics in Table 3. In columns 1–4 of Panel A, we present the statistics for the full sample. An average board comprises nine directors, 70% of whom can be classified as independent.[2] The average proportion of women on the board is 10%, which suggests that there is one female director on an average board. Compared with this proportion of female directors, the proportion of externally connected males on the board is much higher (28%). This means that over one quarter of male directors on the board has at least one external connection to female directors in their directorship network.

In columns 5–8 of Panel A, we split the sample into firms without women directors on the board and, in columns 9–12, into firms with women directors on the board. The differences between these two groups are consistent with stylized facts reported in the prior literature (Adams & Ferreira, 2009; Carter, D'Souza, Simkins, & Simpson, 2010). Female directors tend to sit on larger and more independent boards. Firms with women directors are larger, are more profitable, and have higher growth opportunities and lower risk. They also have a higher proportion of externally connected men on average. This is consistent with Adams and Ferreira (2009), who argued that lack of access to the professional network could decrease the opportunities for women to be appointed as directors (Oakley, 2000). Thus, firms in which male directors have professional connections to women directors are more likely to appoint women as directors.

Next, in columns 1–4 of Panel B (Table 3), we split the sample into firms without externally connected men and, in columns 5–8, into firms with externally connected men. Connected male directors are more prevalent on larger and more independent boards. The differences in average tenure and age of directors on boards with and without connected men are small, although univariate results show that these differences are statistically significant at the 1% level.

3.3 | Empirical models

To test Hypothesis 1, we use probit estimation of whether or not the director in question is classified by the SEC as meriting an attendance flag, which is present (=1) when the director attends less than 75% of all board meetings in that year. To eliminate the possibility that some directors start their directorship in the middle of the year, we remove the observations where tenure is less than 1 year. We also include # *Other Directorships*, which is the number of other board seats that each director holds. We anticipate the relationship between number of external directorships and the attendance problem to be positive, because directors may face a higher opportunity cost with the increasing number of directorships they hold (Ferris et al., 2003; Fich, 2005). Board size may also be positively related to attendance problems, because large boards may experience a free-riding problem (Jensen, 1993; Lipton & Lorsch, 1992)—failing to attend meetings may be less noticeable in larger boards. Independent directors may improve governance and, as a result, improve the attendance behavior of other directors; thus, the proportion of independent directors may be negatively related to the attendance problem.

Firm-level control variables include total assets (in log form), Tobin's *Q*, return on assets (ROA), and stock return volatility (in log form). These firm characteristics may be related to the attendance problem as, due to concerns for their reputation, directors may be more likely to attend meetings in larger and more reputable firms (Masulis & Mobbs, 2014). Additionally, directors may be more likely to attend board meetings when the firm is operating in a challenging or volatile environment such as when its performance is poor or when performance variability is high. Thus, we anticipate that the attendance problem will increase with ROA and decrease with total risk.

Initially, male and female directors are pooled, allowing for a male dummy variable in order to identify gender-specific differences:

$$\Pr(\text{Absentee}_{i,t} = 1) = \Phi(\beta_0 + \beta_1 \text{Male Director}_{i,t} + \mathbf{X}_{i,t} + \varepsilon_{i,t}). \quad (1)$$

The probability of absenteeism (denoted by Φ) is explained by the gender of the director (Male Director$_{i,t}$) and a set of control variables ($\mathbf{X}_{i,t}$). We include a range of control variables capturing firm and

TABLE 3 Summary statistics (firm years)

Panel A: All firms, firms without female directors, and firms with female directors

	All firms				Subsample by the presence of women							
					Firms without women on board				Firms with women on board			
	Mean (1)	StDev (2)	Min (3)	Max (4)	Mean (5)	StDev (6)	Min (7)	Max (8)	Mean (9)	StDev (10)	Min (11)	Max (12)
Proportion of Men Externally Connected with Women	0.28	0.24	0.00	1.00	0.16	0.17	0.00	0.90	0.35	0.24	0.00	1.00
Proportion of Women	0.10	0.10	0.00	0.63	0.00	0.00	0.00	0.00	0.16	0.07	0.06	0.63
# Other Directorships	0.54	0.47	0.00	3.44	0.35	0.35	0.00	2.75	0.65	0.49	0.00	3.44
Board Size	8.99	2.29	3.00	23.00	7.61	1.76	3.00	20.00	9.78	2.19	4.00	23.00
% of Independent Directors	0.71	0.16	0.00	1.00	0.66	0.17	0.00	1.00	0.73	0.15	0.00	1.00
Average Director Age	60.18	4.25	40.33	77.88	59.96	4.94	40.33	77.88	60.30	3.80	42.60	77.20
Average Director Tenure	9.73	3.99	1.00	34.67	10.16	4.49	1.00	34.67	9.48	3.65	1.00	30.00
Female CEO	0.02	0.15	0.00	1.00	0.00	0.00	0.00	0.00	0.04	0.19	0.00	1.00
Total Assets ($ billions)	6.20	18.20	0.02	334.00	1.76	3.58	0.02	73.50	8.75	22.30	0.02	334.00
Tobin's Q	2.02	1.33	0.70	9.76	2.11	2.03	0.40	78.56	2.02	1.48	0.41	39.12
ROA	0.04	0.15	−5.88	0.78	0.03	0.21	−5.88	0.78	0.05	0.10	−1.77	0.60
R&D Expenditures	0.08	1.97	0.00	237.86	0.14	3.23	0.00	237.86	0.05	0.36	0.00	29.77
Capital Expenditures	0.09	1.89	−0.90	233.99	0.09	0.16	−0.02	1.02	0.06	0.10	−0.02	1.02
Leverage	0.21	0.18	0.00	1.87	0.19	0.19	0.00	1.52	0.23	0.17	0.00	1.87
CEO Chair Duality	0.46	0.50	0.00	1.00	0.43	0.49	0.00	1.00	0.48	0.50	0.00	1.00
CEO Tenure	7.13	7.57	0.00	61.00	8.49	8.57	0.00	61.00	6.36	6.82	0.00	51.00
CEO Turnover	0.08	0.27	0.00	1.00	0.07	0.26	0.00	1.00	0.08	0.27	0.00	1.00
Total Risk	0.45	0.21	0.10	3.06	0.52	0.23	0.15	3.06	0.41	0.19	0.10	2.07
Systematic Risk	1.30	0.63	−0.56	5.13	1.48	0.71	−0.50	5.13	1.20	0.56	−0.56	4.99
Idiosyncratic Risk	0.39	0.19	0.08	3.04	0.45	0.21	0.12	3.04	0.35	0.17	0.08	2.04
Observations	15,982	15,982	15,982	15,982	6,130	6,130	6,130	6,130	9,852	9,852	9,852	9,852

Panel B: Firms without externally connected male directors and firms with externally connected male directors

	Subsample by connection with women							
	Firms without men externally connected to women				Firms with men externally connected to women			
	Mean (1)	StDev (2)	Min (3)	Max (4)	Mean (5)	StDev (6)	Min (7)	Max (8)
Proportion of Men Externally Connected with Women	0.00	0.00	0.00	0.00	0.36	0.21	0.05	1.00
Proportion of Women	0.07	0.10	0.00	0.57	0.11	0.09	0.00	0.63
# Other Directorships	0.10	0.16	0.00	1.33	0.67	0.45	0.07	3.44
Board Size	7.51	1.80	3.00	15.00	9.42	2.24	4.00	23.00
% of Independent Directors	0.64	0.17	0.00	1.00	0.73	0.15	0.00	1.00
Average Director Age	59.28	5.11	40.33	77.20	60.44	3.93	42.33	77.88
Average Director Tenure	10.62	4.70	1.00	30.60	9.46	3.72	1.00	34.67
Female CEO	0.02	0.15	0.00	1.00	0.02	0.15	0.00	1.00
Total Assets ($ billion)	1.28	2.68	0.02	60.70	7.64	20.40	0.02	334.00
Tobin's Q	2.17	1.79	0.40	36.19	2.02	1.68	0.41	78.56
ROA	0.03	0.17	−3.88	0.55	0.04	0.15	−5.88	0.78

(Continues)

TABLE 3 (Continued)

Panel B: Firms without externally connected male directors and firms with externally connected male directors

	Subsample by connection with women							
	Firms without men externally connected to women				Firms with men externally connected to women			
	Mean (1)	StDev (2)	Min (3)	Max (4)	Mean (5)	StDev (6)	Min (7)	Max (8)
R&D Expenditures	0.09	0.72	0.00	29.77	0.08	2.21	0.00	237.86
Capital Expenditures	0.09	0.19	−0.69	2.79	0.09	2.14	−0.90	233.99
Leverage	0.17	0.19	0.00	1.87	0.22	0.17	0.00	1.74
CEO Chair Duality	0.44	0.50	0.00	1.00	0.46	0.50	0.00	1.00
CEO Tenure	9.19	9.39	0.00	61.00	6.54	6.85	0.00	55.00
CEO Turnover	0.08	0.27	0.00	1.00	0.08	0.27	0.00	1.00
Total Risk	0.51	0.22	0.14	2.23	0.43	0.21	0.10	3.06
Systematic Risk	1.44	0.68	−0.30	5.12	1.26	0.61	−0.56	5.13
Idiosyncratic Risk	0.44	0.21	0.12	2.19	0.37	0.18	0.08	3.04
Observations	3,695	3,695	3,695	3,695	12,287	12,287	12,287	12,287

Note: The sample covers the period between 1996 and 2012. Panel A presents summary statistics for all firm years in the sample (columns 1–4), a subsample of firms with female directors on board (columns 5–8), and a subsample of firms without female directors on board (columns 9–12). Panel B presents a subsample of firms without any externally connected male director (columns 1–4) and a subsample of firms with externally connected male directors (columns 5–8). Descriptions of all variables are provided in Table 1. Board characteristics are constructed using the information from the RiskMetrics database. Accounting variables are obtained from the Compustat database. Stock return and risk measures are calculated using price data from the Center for Research in Security Prices.

governance characteristics. Industry and year dummies are also included in all specifications. The *Male Director* dummy is subsequently split into *Externally Connected with Women* and *Not Externally Connected with Women*. To establish the importance of the spillover effect, analysis is also conducted on the sample of male directors only.

To test Hypothesis 2, we again conduct a board-level probit analysis, but this time using *CEO Turnover*, a dummy variable equal to one when the CEO is replaced in any of the subsequent 3 years:

$$\Pr(\text{CEO Turnover}_{i,t+3} = 1) = \Phi(\beta_0 + \beta_1 \text{Proportion of Men Externally Connected with Women}_{i,t} + \mathbf{X}_{i,t} + \varepsilon_{i,t}). \quad (2)$$

The probability of CEO turnover (denoted by Φ) is explained by the proportion of men with external female connections (connected men), the proportion of women on board and a set of control variables ($\mathbf{X}_{i,t}$). We also include industry and time dummies. The analysis is run over all boards and subsequently separately for those boards with women directors and for those with no women directors.

Finally, we test Hypothesis 3 in the following regression equation:

We use three measures of equity risk: total risk, systematic risk, and idiosyncratic risk. Total risk is calculated as the standard deviation of daily stock returns over the last year. Systematic risk is the coefficient on the stock market portfolio from a market-model regression using the CRSP NYSE/AMEX/Nasdaq/Arca equally weighted index. Idiosyncratic risk is the standard deviation of the residuals from the market model regression. To annualize total and idiosyncratic standard deviations, we multiply their daily equivalents by the square root of 250.

Total risk is the sum of systematic risk and idiosyncratic risk, the two main types of risk that are borne by shareholders. Systematic risk captures the sensitivity of a firm's return to market-wide conditions, whereas firm-specific risk captures the impact of other events that affect each specific firm. Examining these three risk measures allow us to present a complete view of whether the presence of connected male directors can influence risk taking of our sample firms. The key variable is again the *Proportion of Men Externally Connected with*

$$\text{Risk Measure}_{i,t} = \beta_0 + \beta_1 \text{Proportion of Men Externally Connected with Women}_{i,t} + \mathbf{X}_{i,t} + \varepsilon_{i,t}. \quad (3)$$

Women. Analysis is run over all boards and then separately for only those boards that have women directors and only those boards with no women directors. As above, various board characteristics are included as control variables ($\mathbf{X}_{i,t}$). We also include firm effects, to take account of the possibility that there are other unobserved firm-level factors that can influence both firm risk and the choice of having externally connected male directors on the board and year fixed effects in all specifications.[3]

4 | EMPIRICAL FINDINGS

4.1 | Test of Hypothesis 1: The spillover effect and board attendance

Table 4 shows the results for the test of Hypothesis 1. In column 1, the coefficient for *D (Male Director)* is positive and significant at the 1% level, indicating that male directors are more likely to exhibit attendance problems than their female counterparts. The estimated probit coefficient (0.121) implies that the average marginal effect of *D (Male Director)* is 0.004. Given that the fraction of attendance problems in our data is 0.014, women are roughly 28.6% (=0.004/0.014) less likely to exhibit attendance problems than men. This is consistent with the results in Adams and Ferreira (2009) that female directors and male directors appear to behave differently in terms of board attendance. The results in column 2, which splits the male dummy variable by whether or not the director in question is connected externally to women directors, suggest that such external contact reduces the male attendance problem. This is further analyzed in detail in the subsequent columns of Table 4.

Focusing specifically on the behavior of male directors by restricting the sample to male directors only, column 3 of Table 4 suggests that, in contrast to Adams and Ferreira (2009), there is no significant relationship between male board attendance and the presence of women on the focal board. It is worth noting, however, that we can replicate the significant results of Adams and Ferreira (2009) if we restrict the sample to their original time period of 1996–2003[4]; however, over the longer period available for our sample (1996–2012), the effect is no longer significant.

To test Hypothesis 1 (i.e., whether the attendance of male directors is affected by the presence of both internal and external connections to women directors), columns 4 and 5 split male directors by whether or not they are connected externally to women. When they are externally connected (column 4), the presence of women on the focal board is statistically significant.[5] In the absence of an external connection (column 5), the coefficient on the proportion of women on the focal board is insignificant. Columns 6 and 7 of Table 4 offer a different perspective on this result by separating male directors by whether or not the focal board contains women directors. In this case, on boards with women present (column 6), male directors with external connections to women directors are significantly less likely to exhibit board attendance problems. The insignificant coefficient in column 7 suggests that external connections to women are, in and of themselves, not sufficient and that it is also important to have the presence of women on the focal board.

Taken together, these results suggest that we cannot reject Hypothesis 1. When male directors sit on boards alongside female directors (column 4), their connections to female directors through outside boards are associated with a significant improvement in their attendance record. The estimated coefficient is −0.736, which is equal to a 17% decrease in the likelihood of the attendance problem. The results of column 5 suggest that when male directors serve on boards alongside women directors, there is no significant impact on their behavior unless they are also externally connected with women directors through their board network.

From the alternative perspective, among male directors serving on a board with women present and with external connections to other women directors, the attendance problem is reduced. The estimated coefficient in column 6 is −0.104, which is equal to a 25.04% decrease in the likelihood of the attendance problem. Equally, the results in column 7, relating to the behavior of male directors who find themselves on boards with no female directors, suggest that their behavior is unaffected by whether or not they have contact with women directors through outside boards.

These results are consistent with the finding of Adams and Ferreira (2009) that male directors have fewer attendance problems in gender-diverse boards. However, although results confirm the necessity of the presence of women on the board, they also highlight the importance of exposure to female directors through service on outside boards. When male directors have external connections to women, they are less likely to have attendance problems on boards that are themselves gender diverse.

4.2 | Test of Hypothesis 2: The spillover effect and the performance sensitivity of CEO turnover

The results from the absentee problem estimation discussed above demonstrate that male directors with external connections to female directors are less likely to miss board meetings, which suggests that they may be more conscientious in terms of monitoring. In this section, we investigate whether the presence of these connected male directors actually affects the decision making of the firm. Given that directors meet only infrequently, the role of the board may not be obvious in day-to-day operations but may be more easily detected in large and discrete corporate decisions (Levi, Li, & Zhang, 2014). We, therefore, look at CEO turnover as one possible manifestation of director monitoring. We argue that the more effective a board is in its monitoring duties, the more likely it is to dismiss the CEO in bad times (Hermalin & Weisbach, 2003; Mace, 1971).

Columns 1 and 2 of Table 5 report the probit estimates of Equation 2 on the sample of all firms. In both columns, the coefficient on the presence of a woman on board, *D (With Women)*, is insignificant, suggesting that, by itself, the presence of women on the board has no impact on the performance sensitivity of CEO replacement. Nevertheless, in underperforming companies (column 1), the results show a

TABLE 4 Director absenteeism

	All directors		Male directors				
			All men	Connected with women	Not Connected with women	Boards with women	Boards without women
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
D (Male Director)	0.12***						
	(0.04)						
D (Externally Connected with Women)		0.09*				−0.10**	0.05
		(0.05)				(0.05)	(0.07)
D (Not Externally Connected with Women)		0.14***					
		(0.05)					
Proportion of Women			−0.27	−0.74**	−0.04	0.05	
			(0.20)	(0.36)	(0.24)	(0.30)	
# Other Directorships	0.02	0.03*	0.02	0.05*	0.03	0.03*	0.08*
	(0.01)	(0.02)	(0.02)	(0.03)	(0.04)	(0.02)	(0.04)
Board Size	0.04***	0.04***	0.04***	0.04***	0.04***	0.04***	0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Proportion of Independent Directors	−0.15	−0.15	−0.08	0.10	−0.17	−0.22	0.10
	(0.12)	(0.12)	(0.12)	(0.21)	(0.15)	(0.16)	(0.19)
Tenure	−0.01***	−0.01***	−0.01**	−0.01	−0.01**	−0.01**	−0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age	−0.01***	−0.01***	−0.01***	−0.01**	−0.01***	−0.01**	−0.01**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Log (Total Assets)	−0.03*	−0.03*	−0.02	−0.08***	0.01	−0.01	−0.03
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Tobin's *Q*	−0.00	−0.00	−0.01	−0.01	−0.01	−0.00	−0.01
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
ROA	0.09	0.09	0.10	0.01	0.16	0.20	0.06
	(0.10)	(0.10)	(0.11)	(0.15)	(0.14)	(0.18)	(0.11)
Total Risk	0.08	0.08	0.07	0.02	0.11	0.10	−0.00
	(0.05)	(0.05)	(0.05)	(0.09)	(0.07)	(0.07)	(0.09)
Director Compensation	−0.00***	−0.00***	−0.00***	−0.00	−0.00***	−0.00***	−0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations	80,395	80,395	69,676	22,684	46,992	46,407	23,269
Pseudo R^2	0.05	0.05	0.05	0.07	0.05	0.06	0.06

Note: This table reports director-level probit estimates of *Absenteeism*, which is a dummy variable set to be equal to one when the proxy statement reports that the director attends less than 75% of board meetings and zero otherwise. *D (Male Director)* is equal to one for male directors and zero for female directors. *D (Connected with Women)* is a dummy variable that equals one when a male director has at least one external connection to women and zero otherwise. *D (Not Connected with Women)* is a dummy variable that equals one when a male director does not have any external connection to women and zero otherwise. A male director is considered to have an external connection to women when he sits on other boards on which there is at least one female director. *Proportion of Women* is the number of female directors divided by the number of all directors on board. Industry and year dummy variables are included in all specifications. Other variables are defined in Table 1. Standard errors (in brackets) are robust to heteroskedasticity and serial correlations within director-level clusters.

*Statistically significant at 10%.

**Statistically significant at 5%.

***Statistically significant at 1%.

positive relationship between the *Proportion of Men Externally Connected with Women* and *CEO Turnover*, significant at the 5% level. The result in column 1 appears to indicate that CEOs are more likely to be replaced in bad times when there are more male directors with external connections to women, whether or not there is any female director on board.

TABLE 5 CEO turnover

	All boards		Boards with women		Boards without women	
Firm performance	**Bad**	**Good**	**Bad**	**Good**	**Bad**	**Good**
Dependent variable = CEO Turnover	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Proportion of Men Externally Connected with Women	0.49**	0.14	0.64***	0.35	−0.14	−0.58
	(0.22)	(0.21)	(0.24)	(0.25)	(0.46)	(0.40)
D (With Women)	0.10	0.07				
	(0.07)	(0.07)				
# Other Directorships	−0.36***	−0.19*	−0.47***	−0.27**	0.07	0.14
	(0.11)	(0.11)	(0.13)	(0.13)	(0.22)	(0.20)
Board Size	−0.03	0.14**	0.07	0.28***	−0.36**	−0.14
	(0.07)	(0.07)	(0.10)	(0.11)	(0.18)	(0.13)
Board Size Squared	−0.00	−0.01**	−0.00	−0.01***	0.02*	0.01
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
Proportion of Independent Directors	0.47**	0.20	0.77***	0.40	0.07	0.02
	(0.20)	(0.19)	(0.26)	(0.26)	(0.32)	(0.31)
Log (Total Assets)	0.07***	0.04	0.06**	0.01	0.08	0.09*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)
Total Risk	0.20**	0.14*	0.21**	0.08	0.27*	0.26*
	(0.09)	(0.09)	(0.11)	(0.11)	(0.15)	(0.14)
CEO Tenure	−0.01**	−0.01**	0.00	−0.00	−0.02***	−0.01**
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
CEO Age	0.03***	0.03***	0.04***	0.02***	0.04***	0.04***
	(0.00)	0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Female CEO	0.21	−0.06	0.25	−0.03		
	(0.16)	(0.17)	(0.17)	(0.17)		
Diversification	−0.06	−0.06	−0.07	−0.04	−0.06	−0.11
	(0.04)	(0.04)	(0.06)	(0.05)	(0.07)	(0.07)
CEO/Chair Duality	−0.42***	−0.47***	−0.43***	−0.45***	−0.47***	−0.55***
	(0.06)	(0.06)	(0.07)	(0.07)	(0.10)	(0.10)
Observations	4,174	4,125	2,774	2,620	1,400	1,505
Pseudo-R^2	0.06	0.06	0.07	0.06	0.07	0.10

Note: This table reports probit estimates of CEO turnover on the proportion of male directors who sit on the same board as at least one female director in their other directorships and control variables. The dependent variable (CEO Turnover) is a dummy variable set to one if the firm experience a change in CEO within the following three years and zero otherwise. Firm performance is defined as bad (good) when profitability (as proxied by return to assets) is below (above) firm-level median. Industry and year dummy variables are included in all specifications. Other control variables are defined in Table 1. Standard errors (in brackets) are robust to heteroskedasticity and serial correlations within firm-level clusters.

*Statistically significant at 10%.

**Statistically significant at 5%.

***Statistically significant at 1%.

However, when we divide our sample based on the presence of women on the focal board (internal connections), the results again indicate the interaction effect between internal and external connections to women. In columns 3 and 4, the sample comprises firm years where there is at least one female director on board. The coefficient for the *Proportion of Men Externally Connected with Women* remains statistically significant for underperforming CEOs in column 3. In contrast, in columns 5 and 6, when we use the sample comprising firm years without any female director on board, the corresponding coefficient is not statistically different from zero.

The difference in the economic effects is also large. We compare two hypothetical firms, one where 50% of the male directors are connected (Firm A) against another where none of the male directors is connected (Firm B). In column 1, we calculate predicted probabilities and find that the probability of an underperforming CEO being dismissed in bad times, keeping all other control variables at their mean is 22.95% for Firm A and only 16.22% for Firm B. These differences are more pronounced in boards overseen by women directors (column (3)).

Overall, these results suggest that CEOs on gender-diverse boards are more likely to be replaced in bad times when the male directors on the board are externally connected with women. This lends support to the interpretation that, consistent with Hypothesis 2, the interaction of male directors with women directors outside and inside a specific board leads to more conscientious monitoring via higher CEO turnover in bad times.

TABLE 6 Risk taking

	All firms			Boards with women			Boards without women		
	Total risk	Systematic risk	Idiosyncratic risk	Total risk	Systematic risk	Idiosyncratic risk	Total risk	Systematic risk	Idiosyncratic risk
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Proportion of Men Externally Connected with Women	−0.07** (0.03)	−0.10* (0.06)	−0.07** (0.03)	−0.10*** (0.04)	−0.10* (0.06)	−0.09*** (0.04)	−0.05 (0.06)	−0.23 (0.14)	−0.04 (0.06)
D (With Women)	−0.00 (0.01)	−0.02 (0.02)	−0.00 (0.01)						
# Other Directorships	0.05** (0.02)	0.07** (0.04)	0.05*** (0.02)	0.06*** (0.02)	0.06 (0.04)	0.06*** (0.02)	0.04 (0.03)	0.23*** (0.08)	0.03 (0.03)
Board Size	−0.01* (0.00)	−0.02*** (0.01)	−0.01** (0.00)	0.00 (0.00)	−0.00 (0.01)	0.00 (0.00)	−0.01** (0.01)	−0.03** (0.01)	−0.01** (0.01)
Proportion of Independent Directors	−0.03 (0.03)	0.01 (0.07)	−0.04 (0.03)	−0.03 (0.04)	0.05 (0.08)	−0.05 (0.04)	−0.00 (0.06)	0.06 (0.13)	−0.03 (0.06)
Log (Total Assets)	−0.08*** (0.01)	0.04* (0.02)	−0.11*** (0.01)	−0.09*** (0.02)	−0.03 (0.03)	−0.11*** (0.02)	−0.03* (0.02)	0.22*** (0.04)	−0.08*** (0.02)
Tobin's *Q*	0.00* (0.00)	0.04*** (0.01)	−0.00 (0.00)	0.01 (0.00)	0.05*** (0.01)	−0.00 (0.00)	0.00 (0.00)	0.03*** (0.01)	−0.00 (0.00)
ROA	−0.20*** (0.03)	−0.39*** (0.06)	−0.20*** (0.03)	−0.41*** (0.05)	−0.54*** (0.10)	−0.42*** (0.06)	−0.15*** (0.03)	−0.32*** (0.07)	−0.15*** (0.03)
R&D Expenditures	−0.01 (0.01)	−0.03* (0.02)	−0.00 (0.01)	−0.01 (0.02)	−0.08*** (0.03)	−0.00 (0.01)	−0.01 (0.01)	−0.01 (0.02)	−0.01 (0.01)
Capital Expenditures	0.01 (0.01)	0.03** (0.02)	0.01 (0.01)	0.07 (0.05)	0.22 (0.14)	0.03 (0.04)	0.01* (0.01)	0.01 (0.02)	0.01 (0.01)
Leverage	0.17*** (0.04)	0.09 (0.08)	0.21*** (0.04)	0.16*** (0.04)	0.06 (0.09)	0.20*** (0.05)	0.10 (0.06)	0.02 (0.13)	0.14** (0.06)
Log (1 + FirmAge)	−0.31*** (0.04)	−0.74*** (0.08)	−0.21*** (0.04)	−0.26*** (0.05)	−0.56*** (0.09)	−0.16*** (0.05)	−0.51*** (0.07)	−1.11*** (0.17)	−0.41*** (0.07)
Average Director Age	−0.01*** (0.00)	−0.02*** (0.00)	−0.00** (0.00)	−0.01*** (0.00)	−0.01*** (0.00)	−0.01** (0.00)	−0.01* (0.00)	−0.01* (0.01)	−0.00 (0.00)
Average Director Tenure	0.00* (0.00)	0.01*** (0.00)	0.00 (0.00)	0.00 (0.00)	0.01** (0.00)	0.00 (0.00)	0.00 (0.00)	0.02* (0.01)	0.00 (0.00)
Constant	0.90*** (0.17)	4.50*** (0.36)	0.52*** (0.17)	0.83*** (0.25)	4.16*** (0.47)	0.42* (0.25)	1.20*** (0.28)	4.34*** (0.66)	1.00*** (0.28)
Observations	15,139	15,139	15,139	9,548	9,548	9,548	5,591	5,591	5,591
R^2	0.61	0.19	0.60	0.63	0.21	0.61	0.59	0.20	0.59

Note: This table reports results from firm-level fixed effects estimations of equity risk measures on the proportion of connected men. *Total Risk* is the natural logarithm of daily stock price volatility multiplied by the square root of 250. *Systematic Risk* is the regression coefficient for market returns (using CRSP value-weighted index) from the single-factor market model. *Idiosyncratic Risk* is the natural logarithm of the residuals from the single-factor market model multiplied by the square root of 250. The fixed effects estimations include year dummy variables as controls. Other variables are defined in Table 1. Standard errors (in brackets) are robust to heteroskedasticity and serial correlations within firm-level clusters.

*Statistically significant at 10%.

**Statistically significant at 5%.

***Statistically significant at 1%.

4.3 | Test of Hypothesis 3: The spillover effect and equity risk

We have shown that male directors in the presence of female directors behave differently in terms of their own attendance when they are also externally connected with women in their other directorships. We have also shown that the presence of such female-connected male directors can explain firm-level monitoring in terms of the performance accountability of CEO turnover, again when the focal firm has at least one female director on the board. In this section, we relate

the presence of an externally connected male director to firm risk taking. We use measures of equity risk, or return volatility, as our proxies for firm risk taking. Return volatility is a standard proxy for risk in the financial economics literature (Adams & Ragunathan, 2017; Sila et al., 2016). Equity risk measures capture the riskiness of corporate investment decisions.

Table 6 presents the results of estimating Equation 3. Again, the results indicate the interaction effect between the internal and external connections of gender diversity. In columns 1–3, we estimate Equation 3 on the full sample of all firms. Although the variable capturing the presence of women on the board, *D (With Women)*, is statistically insignificant in all three columns (leading us to reject Hypothesis 3a), we find the coefficients for *Proportion of Men Externally Connected with Women* to be negative and statistically significant at conventional levels for each of the three equity risk measures. This suggests that the presence of externally connected male directors is associated with lower firm-level performance variability. A 10% increase in the proportion of males with female external connections is associated with an approximately 0.67% (0.067/10 * 100) decrease in the standard deviation of returns, a 0.01 (0.1/10) unit decrease in systematic (market) risk, and a 0.70% (0.07/10 * 100) decrease in the idiosyncratic risk measure. These coefficients represent modest economic effects. As a comparison, column 1 suggests that a 10% increase in a firm's leverage is associated with a 1.69% decrease in the standard deviation of returns.

In columns 4–6 of Table 6, we re-estimate all three risk equations while restricting the sample to gender-diversified boards (firm years where there is at least one female director on the focal board). Consistent with Hypothesis 3b, the estimated coefficients on the externally connected male directors are negative and statistically significant. These estimated coefficients also suggest that the economic effect of additional males with female external connections is larger on boards with female directors. In column 4, a 10% increase in the proportion of connected men, for example, an additional director on an average board of nine people, is associated with 0.95% (0.095/10 * 100) decrease in return standard deviation, compared with 0.67% in the full sample. By contrast, when in columns 7–9 we restrict the sample to the firm years where there are no female directors on the focal board, the coefficients are no longer statistically significant, although they remain negative in sign. The overall results suggest that, consistent with Hypothesis 3b, external connections (i.e., the proportion of male directors who work with female directors on other boards) matter, but only when female directors are present on the focal board. Simply having women on the focal board is not, however, sufficient in itself to alter risk-taking decisions.

5 | ROBUSTNESS CHECKS

So far, the external connections of male directors are being treated as exogenous. However, the possibility of the external connections of male directors being endogenous must be recognized. An alternative explanation for our results could be that industry effects lead to a higher connectivity between male and female directors, with the latter being no different to their male counterparts, and also being part of the same network in the firm's industry. To address this concern, we use a new measure of connectedness that excludes connections of men and women when working in the same industry. Although the number of directors with female connections decreases by 31% (from 22,684 to 15,641), our main results still hold across all specifications. Results are presented as part of the Online Appendix.

We also compute a connectedness measure that excludes any overlaps of the same male–female directors sitting on the same boards outside the focal firm. The number of male directors with connections decreases from 22,684 to 17,216. Our results are robust to this alternative measure. Results are presented as part of the Online Appendix.[6]

We note that external connectedness of male directors may also be an indicator of the most valued and reputable directors (Fich, 2005; Masulis & Mobbs, 2014).[7] Consequently, the attendance behavior of such directors may reflect their attention to building and maintaining a reputation rather than the influence effects of working alongside female directors in various directorships. To address these concerns, a range of robustness checks is performed on the above results. Details are available in the Online Appendix. These checks include (i) allowing for newly appointed directors being particularly conscientious, (ii) allowing for a history of board appointments not reflected in current positions, and (iii) weighting the effect of external connections to women by the numbers of women on the various boards. In an additional attempt to eliminate endogeneity, further estimation is undertaken in the form of pairwise *t*-tests that limit the analysis to those situations where the same director is observed on at least two boards. Finally, the regressions on firm risk are repeated using generalized methods of moments, again in an effort to eliminate any effects arising from the possibility that those observed serving alongside women on other boards are different in unmeasured ways from other directors. None of these robustness checks alter our basic result.

6 | DISCUSSION AND CONCLUSION

We find that director behavior and decision making are affected by boardroom gender diversity. The observed effects include director personal responsibility (board attendance), accountability (the performance sensitivity of CEO separations), and firm risk taking (share price volatility). A key finding is that these effects are associated not only with gender diversity on the focal board but also with male director experience of working alongside female directors on other boards. In this sense, we document a spillover effect, whereby a board with male directors who have experience of working with women directors in board assignments other than the focal board is measurably more affected by gender diversity.

Individually, we find that male directors with both internal and external connections to female directors are less likely to exhibit attendance problems. More broadly, these same gender diversity

conditions are found to extend to metrics of board governance performance—specifically, the extent of CEO accountability for firm performance and the riskiness of the firm's investment decisions. CEOs in underperforming companies are more likely to be replaced in the presence of a gender-diverse board where the male directors have some external connections to working with women on other boards. A similar result is obtained in terms of those firms with gender-diverse boards having a lower share price volatility (being less risky).

Based on the reasoned action approach (Fishbein & Ajzen, 2010) as shown in Figure 1, we argue that, on gender-diverse boards, social norms and hence behaviors are more susceptible to the influence of female directors, when male directors have experience of working alongside female directors—not only on the focal board but also through their other various directorships (Cialdini & Goldstein, 2004; Cronqvist & Yu, 2017; Pedersen, Keithly, & Brady, 1986). A key factor in this socially embedded process (Westphal, 1999; Westphal & Park, 2020) seems to be the external validation through male directors working alongside female directors on other boards on which they serve. Such experience seems to undermine any role congruity bias (Eagly & Karau, 2002; Schein, 1975) or correspondence bias (Gawronski, 2004; Nier, Bajaj, McLean, & Schwartz, 2013) and the associated reactive devaluation (Ross & Stillinger, 1991) that otherwise threatens to undermine the contributions of women in senior positions such as board directorships. Consequently, in the presence of male directors who have also worked alongside women directors on other boards and whose biases originating in gender stereotyping have been undermined through repeated exposure in different boardroom settings (Beaman et al., 2009), the social norms of the board are more susceptible to gender diversity. Female directors are thereby able to make a more effective contribution to the board's social norms and, from the perspective of the reasoned action approach, on its attitudes and intentions. The result is a context more accepting of gender diversity (Zhang, 2020) and a boardroom more likely to realize the benefits of deep diversity (Harrison et al., 1998).

Previous research in this area has largely concentrated on the impact of women within boardrooms (Adams & Ferreira, 2009; Lucas-Perez et al., 2015; Mateos de Cabo et al., 2012). Our results add to this existing literature by showing that the wider boardroom experience of externally connected male directors is also important to the gender debate and provides an additional mechanism enabling female directors to make an effective difference to board governance. The key implication of this paper is that female directors can have an impact on firm-level outcomes even when they are in the minority on most boards. Consistent with the work of Iannotta, Gatti, and Huse (2016), who posited a jointly causal nature of diversity, what we find is not a direct impact: the proportion of women on boards, in and of itself, is not sufficient to explain firm-level outcomes in a statistically significant way. It is the added consideration of the proportion of male directors who can draw on the experience of working alongside female directors in their wider directorship network that proves key.

It is as if what is experienced internally or proximally on one board (specifically the influence of female directors) is, on its own, too easily discounted by role congruity bias (Eagly & Karau, 2002) and gender stereotyping unless these biases are undermined through similar contributions being witnessed on boards that are more distal. For those men also encountering women directors contributing on other more distal boards, the biased filtering out or discounting of the contributions of women directors is more difficult to sustain, thereby facilitating the impact of female directors on the board's social norms, as captured in the reasoned action approach (Fishbein & Ajzen, 2010). Thus, this paper suggests a new way in which gender diversity in boardrooms can be viewed. Given that female representation in the boardroom is increasing, due to both regulatory and social pressure, the spillover effect identified here suggests that the impact of such policy-induced changes on firm behavior may be more significant than previously documented.

This positive externality or spillover effect also suggests an important policy implication. Improved governance effects resulting from higher female participation in the boardroom may arise not only from the direct effect of women being present but also through network effects whereby fellow male directors who have exposure elsewhere to working with female directors (on other boards) are more likely to be influenced by their presence on any given board. Policy efforts aimed at increasing the presence of women in the boardroom are afoot in many countries (Bertrand, 2018). The additionality or spillover effect, which is the focus of this paper, implies that the payoff of such policies is likely to be nonlinear, impacting not simply on the boards where increased representation occurs but influencing behavior on other boards as the number of connected male directors expands and the behavior of these male directors is affected.

ACKNOWLEDGEMENTS

We are grateful to Renée Adams, Mario Daniele Amore, Jo Danbolt, Jens Hagendorff, Charles O'Reilly, participants at EFMA 2015 Annual Conference, FMA 2016 European Annual Conference, 2018 Academy of Management Meeting, and seminar participants at the University of Edinburgh, University of Glasgow and University of Stirling for helpful comments.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

Data Availability Statement

The data that support the findings of this study are available from Wharton Research Data Services. Restrictions apply to the availability of these data, which were used under license for this study.

ORCID

Angelica Gonzalez https://orcid.org/0000-0003-0769-0617

NOTES

[1] This is also known as the theory of planned behavior (Ajzen, 1988, 1991). This theory has been widely used to understand the role of attitudes, subjective norms, and perceived behavioral control in predicting a variety of behaviors, including health-related behavior (Armitage &

Conner, 2000; Conner & Sparks, 1996; Sheeran & Taylor, 2006), adoption of technology (Venkatesh, Thong, & Xu, 2012), career choices (Vincent, Peplau, & Hill, 1998), and debt consumption behavior (Xiao, Tang, Serido, & Shim, 2011). This paper uses the reasoned action approach to understand the decision of male directors to exert effort when they are exposed to working alongside women directors.

[2] Using the RiskMetrics definition of director independence, independent directors are defined as those directors who have no material connection to the firm other than a board seat. "Material" is defined as a standard of relationship (financial, personal, or otherwise) that a reasonable person might conclude could potentially influence one's objectivity in the boardroom in a manner that would have a meaningful impact on an individual's ability to satisfy requisite fiduciary standards on behalf of shareholders.

[3] In specifications where the dependent variable is an indicator variable, that is, the probit models in Equations 1 and 2, we do not include firm fixed effects owing to the "short" panel (low T relative to N) nature of the data. This is the so-called "incidental parameter problem" (see, e.g., Arellano & Honoré, 2001). In Equation 3, where we employ OLS instead of probit as the dependent variable is continuous, we include firm fixed effects.

[4] In contrast to the −0.271 coefficient with a *p* value of 0.47 reported on the coefficient in Table 4 for our full sample, the restricted time period of 1996–2003 produces a coefficient of −0.329 with a *p* value of 0.091.

[5] Repeating this analysis in the shorter time period available to Adams and Ferreira (2009), we find an even stronger relationship, with an estimated coefficient on the Proportion of Women of −0.832 with a *p* value of 0.017. This leads us to surmise that institutional changes since 2003 may explain the loss of statistical significance over the longer data series. Specifically, the Sarbanes–Oxley Act of 2002 significantly increases the responsibilities of directors, the scrutiny of director behavior by regulators and investors, and the risk associated with the failure to fulfil their director responsibilities (Linck, Netter, & Yang, 2009). These changes can increase the incentives for directors to attend board meetings (Masulis & Mobbs, 2014) and weaken the relationship between the *Proportion of Women* and board attendance of male directors.

[6] We thank an anonymous referee for these valuable suggestions.

[7] It can also be seen as a proxy for a director's "busyness" (Kaplan & Reishus, 1990), but the results that are consistent with this story would be opposite to ours.

REFERENCES

Adams, R. B., Almeida, H., & Ferreira, D. (2005). Powerful CEOs and their impact on corporate performance. *The Review of Financial Studies*, *18*, 1403–1432. https://doi.org/10.1093/rfs/hhi030

Adams, R. B., de Haan, J., Terjesen, S., & van Ees, H. (2015). Board diversity: Moving the field forward. *Corporate Governance: An International Review*, *23*, 77–82. https://doi.org/10.1111/corg.12106

Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, *94*, 291–309. https://doi.org/10.1016/j.jfineco.2008.10.007

Adams, R. B., & Funk, P. (2012). Beyond the glass ceiling: Does gender matter? *Management Science*, *58*, 219–235. https://doi.org/10.1287/mnsc.1110.1452

Adams, R. B., Hermalin, B. E., & Weisbach, M. S. (2010). The role of boards of directors in corporate governance: A conceptual framework and survey. *Journal of Economic Literature*, *48*, 58–107. https://doi.org/10.1257/jel.48.1.58

Adams, R. B. & Ragunathan, V. 2017. Lehman sisters. Unpublished Working Paper, DOI: https://doi.org/10.2139/ssrn.3046451

Agnew, J., Balduzzi, P., & Sundén, A. (2003). Portfolio choice and trading in a large 401(k) plan. *American Economic Review*, *93*, 193–215. https://doi.org/10.1257/000282803321455223

Ajzen, I. (1988). *Attitudes, personality, and behavior*. Milton Keynes, UK: Open University Press.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*, 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood-Cliffs, New Jersey: Prentice-Hall.

Albaum, G., & Peterson, R. A. (2006). Ethical attitudes of future business leaders: Do they vary by gender and religiosity? *Business & Society*, *45*, 300–321. https://doi.org/10.1177/0007650306289388

Alexander, A. E. (2012). Change in women's descriptive representation and the belief in women's ability to govern: A virtuous cycle. *Politics & Gender*, *8*, 437–464. https://doi.org/10.1017/S1743923X12000487

Arellano, M., & Honoré, B. (2001). Panel data models: Some recent developments. In E. Leamer & J. Heckman (Eds.), *Handbook of econometrics* (Vol. 5) (pp. 3229–3296). North Holland: Amsterdam.

Armitage, C. J., & Conner, M. (2000). Social cognition models and health behavior: A structured review. *Psychology and Health*, *15*, 173–189. https://doi.org/10.1080/08870440008400299

Barber, B. M., & Odean, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *The Quarterly Journal of Economics*, *116*, 261–292. https://doi.org/10.1162/003355301556400

Bartlett, A., & Preston, D. (2000). Can ethical behavior really exist in business? *Journal of Business Ethics*, *23*, 199–209. https://doi.org/10.1023/A:1006037107565

Beaman, L., Chattopadhyay, R., Duflo, E., Pande, R., & Topalova, P. (2009). Powerful women: Does exposure reduce bias? *The Quarterly Journal of Economics*, *124*, 1497–1540. https://doi.org/10.1162/qjec.2009.124.4.1497

Bear, S., Rahman, N., & Post, C. (2010). The impact of board diversity and gender composition on corporate social responsibility and firm reputation. *Journal of Business Ethics*, *97*, 207–221. https://doi.org/10.1007/s10551-010-0505-2

Bebchuk, L., Cohen, A., & Ferrell, A. (2009). What matters in corporate governance? *Review of Financial Studies*, *22*, 783–827. https://doi.org/10.1093/rfs/hhn099

Bertrand, M. (2018). The glass ceiling. *Economica*, *85*, 205–231. https://doi.org/10.1111/ecca.12264

Beyer, S. (1990). Gender differences in the accuracy of self-evaluations of performance. *Journal of Personality and Social Psychology*, *59*, 960–970. https://doi.org/10.1037/0022-3514.59.5.960

Cai, J., Garner, J. L., & Walkling, R. A. (2009). Electing directors. *Journal of Finance*, *64*, 2389–2421. https://doi.org/10.1111/j.1540-6261.2009.01504.x

Campbell, K., & Minguez-Vera, A. (2008). Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics*, *83*, 435–451. https://doi.org/10.1007/s10551-007-9630-y

Carter, D. A., D'Souza, F., Simkins, B. J., & Simpson, W. G. (2010). The gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance: An International Review*, *18*, 396–414. https://doi.org/10.1111/j.1467-8683.2010.00809.x

Chen, J., Cumming, D., Hou, W., & Lee, E. (2016). CEO accountability for corporate fraud: Evidence from the split share structure reform in China. *Journal of Business Ethics*, *138*, 787–806. https://doi.org/10.1007/s10551-014-2467-2

Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, *55*, 591–621. https://doi.org/10.1146/annurev.psych.55.090902.142015

Clatworthy, M. A., & Peel, M. J. (2013). The impact of voluntary audit and governance characteristics on accounting errors in private companies. *Journal of Accounting and Public Policy*, *32*, 1–25. https://doi.org/10.1016/j.jaccpubpol.2013.02.005

Conner, M., & Sparks, P. (1996). The theory of planned behavior and health behaviors. In M. Conner & P. Norman (Eds.), *Predicting health behavior* (pp. 121–162). Buckingham: Open University Press.

Cronqvist, H., & Yu, F. (2017). Shaped by their daughters: Executives, female socialization, and corporate social responsibility. *Journal of Financial Economics*, *126*, 543–562. https://doi.org/10.1016/j.jfineco.2017.09.003

Croson, R., & Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature*, *47*, 448–474. https://doi.org/10.1257/jel.47.2.448

Dimant, E. 2015. On peer effects: Behavioral contagion of (un)ethical behavior and the role of social identity. Unpublished working paper.

Eagly, A. H., & Karau, S. J. (2002). Role congruity theory of prejudice toward female leaders. *Psychological Review*, *109*, 573–598. https://doi.org/10.1037/0033-295X.109.3.573

Ellwood, S., & Garcia-Lacalle, J. (2015). The influence of presence and position of women on the boards of directors: The case of NHS Foundation Trusts. *Journal of Business Ethics*, *130*, 69–84. https://doi.org/10.1007/s10551-014-2206-8

Farrell, K. A., & Hersch, P. L. (2005). Additions to corporate boards: The effect of gender. *Journal of Corporate Finance*, *11*, 85–106. https://doi.org/10.1016/j.jcorpfin.2003.12.001

Ferreira, D. (2015). Board diversity: Should we trust research to inform policy? *Corporate Governance: An International Review*, *23*, 108–111. https://doi.org/10.1111/corg.12092

Ferris, S. P., Jagannathan, M., & Pritchard, A. C. (2003). Too busy to mind the business? Monitoring by directors with multiple board appointments. *Journal of Finance*, *58*, 1087–1112. https://doi.org/10.1111/1540-6261.00559

Fich, E. M. (2005). Are some outside directors better than others? Evidence from director appointments by fortune 1000 firms. *Journal of Business*, *78*, 1943–1972. https://doi.org/10.1086/431448

Fich, E. M., & Shivdasani, A. (2007). Financial fraud, director reputation, and shareholder wealth. *Journal of Financial Economics*, *86*, 306–336. https://doi.org/10.1016/j.jfineco.2006.05.012

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, M.A: Addison-Wesley.

Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach* (p. 10016). New York, NY: Psychology Press, Taylor & Francis Group.

Francoeur, C., Labelle, R., & Sinclair-Desgagn, B. (2008). Gender diversity in corporate governance and top management. *Journal of Business Ethics*, *81*, 83–95. https://doi.org/10.1007/s10551-007-9482-5

Gawronski, B. (2004). Theory-based bias correction in dispositional inference: The fundamental attribution error is dead, long live the correspondence bias. *European Review of Social Psychology*, *15*, 183–217. https://doi.org/10.1080/10463280440000026

Gneezy, U., Niederle, M., & Rustichini, A. (2003). Performance in competitive environments: Gender differences. *The Quarterly Journal of Economics*, *118*, 1049–1074. https://doi.org/10.1162/00335530360698496

Goyal, V. K., & Park, C. W. (2002). Board leadership structure and CEO turnover. *Journal of Corporate Finance*, *8*, 49–66. https://doi.org/10.1016/S0929-1199(01)00028-1

Gregory-Smith, I., Main, B. G. M., & O'Reilly, C. A. (2014). Appointments, pay and performance in UK boardrooms by gender. *Economic Journal*, *124*, F109–F128. https://doi.org/10.1111/ecoj.12102

Guerrero, S., Lapalme, M., Herrbach, O., & Séguin, M. (2017). Board member monitoring behaviors in credit unions: The role of conscientiousness and identification with shareholders. *Corporate Governance: An International Review*, *25*, 134–144. https://doi.org/10.1111/corg.12196

Gul, F. A., Srinidhi, B., & Ng, A. C. (2011). Does board gender diversity improve the informativeness of stock prices? *Journal of Accounting and Economics*, *51*, 314–338. https://doi.org/10.1016/j.jacceco.2011.01.005

Gupta, V. K., Wieland, A. M., & Turban, D. B. (2019). Gender characterizations in entrepreneurship: A multi-level investigation of sex-role stereotypes about high-growth, commercial, and social entrepreneurs. *Journal of Small Business Management*, *57*, 131–153. https://doi.org/10.1111/jsbm.12495

Harrison, D. A., Price, K. H., & Bell, M. P. (1998). Beyond relational demography: Time and the effects of surface- and deep-level diversity on work group cohesion. *The Academy of Management Journal*, *41*, 96–107. https://doi.org/10.2307/256901

Heilman, M. E. (2001). Description and prescription: How gender stereotypes prevent women's ascent up the organizational ladder. *Journal of Social Issues*, *57*, 657–674. https://doi.org/10.1111/0022-4537.00234

Hermalin, B. E., & Weisbach, M. S. (2003). Boards of directors as an endogenously determined institution: A survey of the economic literature. *Economic Policy Review*, *9*, 7–26. https://doi.org/10.2139/ssrn.233111

Hoobler, J. M., Masterson, C. R., Nkomo, S. M., & Michel, E. J. (2018). The business case for women leaders: Meta-analysis, research critique, and path forward. *Journal of Management*, *44*, 2473–2499. https://doi.org/10.1177/0149206316628643

Huse, M., Nielsen, S. T., & Hagen, I. M. (2009). Women and employee-elected board members, and their contributions to board control tasks. *Journal of Business Ethics*, *89*, 581–597. https://doi.org/10.1007/s10551-008-0018-4

Huse, M., & Solberg, A. G. (2006). Gender-related boardroom dynamics. *Women in Management Review*, *21*, 113–130. https://doi.org/10.1108/09649420610650693

Iannotta, M., Gatti, M., & Huse, M. (2016). Institutional complementarities and gender diversity on boards: A configurational approach. *Corporate Governance: An International Review*, *24*, 406–427. https://doi.org/10.1111/corg.12140

Isidro, H., & Sobral, M. (2015). The effects of women on corporate boards on firm value, financial performance, and ethical and social compliance. *Journal of Business Ethics*, *132*, 1–19. https://doi.org/10.1007/s10551-014-2302-9

Izraeli, D. (2000). Women directors in Israel. In R. Burke & M. Mattis (Eds.), *Women on corporate boards of directors: International challenges and opportunities*. Dordrecht: Kluwer Academic Publishers. https://doi.org/10.1007/978-90-481-3401-4_6

Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance*, *48*, 831–880. https://doi.org/10.1111/j.1540-6261.1993.tb04022.x

Kaczmarek, S., Kimino, S., & Pye, A. (2012). Antecedents of board composition: The role of nomination committees. *Corporate Governance: An International Review*, *20*, 474–489. https://doi.org/10.1111/j.1467-8683.2012.00913.x

Kanter, R. M. (1977). *Men and women of the corporation*. New York, NY: Basic Books.

Kaplan, S., Pany, K., Samuels, J., & Zhang, J. (2009). An examination of the association between gender and reporting intentions for fraudulent financial reporting. *Journal of Business Ethics*, *87*, 15–30. https://doi.org/10.1007/s10551-008-9866-1

Kaplan, S. N., & Reishus, D. (1990). Outside directorships and corporate performance. *Journal of Financial Economics*, *27*(2), 389–410.

Kumar, P., & Zattoni, A. (2016). Corporate governance, board gender diversity and firm performance. *Corporate Governance: An International Review*, *24*, 388–389. https://doi.org/10.1111/corg.12172

Larcker, D. F., Richardson, S. A., & Tuna, A. I. (2007). Corporate governance, accounting outcomes and organizational performance. *Accounting Review*, *82*, 963–1008. https://doi.org/10.2308/accr.2007.82.4.963

Larkin, J. M. (2000). The ability of internal auditors to identify ethical dilemmas. *Journal of Business Ethics*, *23*, 401–409. https://doi.org/10.1023/A:1006150718834

Lau, D. C., & Murningham, K. T. (1998). Demographic diversity and faultlines: The compositional dynamics of organizational groups. *The Academy of Management Review*, *23*, 325–340. https://doi.org/10.5465/amr.1998.533229

Levi, M. D., Li, K., & Zhang, F. (2014). Director gender and mergers and acquisitions. *Journal of Corporate Finance*, *28*, 185–200. https://doi.org/10.1016/j.jcorpfin.2013.11.005

Li, F., & Srinivasan, S. (2011). Corporate governance when founders are directors. *Journal of Financial Economics*, *102*, 454–469. https://doi.org/10.1016/j.jfineco.2010.11.006

Li, J., & Hambrick, D. C. (2005). Factional groups: A new vantage on demographic faultlines, conflict, and disintegration in work teams. *Academy of Management Journal*, *48*, 794–813. https://doi.org/10.5465/amj.2005.18803923

Li, J., & Tang, Y. (2010). CEO hubris and firm risk taking in China: The moderating role of managerial discretion. *Academy of Management Journal*, *53*, 45–68. https://doi.org/10.5465/amj.2010.48036912

Linck, J. S., Netter, J. M., & Yang, T. (2009). The effects and unintended consequences of the Sarbanes–Oxley Act on the supply and demand for directors. *Review of Financial Studies*, *22*, 3287–3328. https://doi.org/10.1093/rfs/hhn084

Lipton, M., & Lorsch, J. W. (1992). A modest proposal for improved corporate governance. *Business Lawyer*, *48*, 59–77. https://doi.org/10.2307/40687360

Lucas-Perez, M. E., Mınguez-Vera, A., Baixauli-Soler, J. S., Martin-Ugedo, J. F., & Sanchez-Marin, G. (2015). Women on the board and managers pay: Evidence from Spain. *Journal of Business Ethics*, *129*, 265–280. https://doi.org/10.1007/s10551-014-2148-1

Lundeberg, M. A., Fox, P. W., & Punćcohaŕ, J. (1994). Highly confident but wrong: Gender differences and similarities in confidence judgments. *Journal of Educational Psychology*, *86*, 114–121. https://doi.org/10.1037/0022-0663.86.1.114

Mace, M. L. (1971). *Directors: Myth and reality*. Boston: Harvard Business School Press.

Main, B. G. M., & Gregory-Smith, I. (2018). Symbolic management and the glass cliff: Evidence from the boardroom careers of female and male directors. *British Journal of Management*, *29*, 136–155. https://doi.org/10.1111/1467-8551.12208

Marquardt, C., & Wiedman, C. (2016). Can shareholder activism improve gender diversity on corporate boards? *Corporate Governance: An International Review*, *24*, 443–461. https://doi.org/10.1111/corg.12170

Masulis, R. W., & Mobbs, S. H. (2014). Independent director incentives: Where do talented directors spend their limited time and energy? *Journal of Financial Economics*, *111*, 406–429. https://doi.org/10.1016/j.jfineco.2013.10.011

Mateos de Cabo, R., Gimeno, R., & Nieto, M. J. (2012). Gender diversity on European banks boards of directors. *Journal of Business Ethics*, *109*, 145–162. https://doi.org/10.1007/s10551-011-1112-6

Minton, B. A., Taillard, J. P., & Williamson, R. (2014). Financial expertise of the board, risk taking, and performance: Evidence from bank holding companies. *Journal of Financial & Quantitative Analysis*, *49*, 351–380. https://doi.org/10.1017/S0022109014000283

Nier, J. A., Bajaj, P., McLean, M. C., & Schwartz, E. (2013). Group status, perceptions of agency, and the correspondence bias: Attributional processes in the formation of stereotypes about high and low status groups. *Group Processes & Intergroup Relations*, *16*, 476–487. https://doi.org/10.1177/1368430212454925

Oakley, J. G. (2000). Gender-based barriers to senior management positions: Understanding the scarcity of female CEOs. *Journal of Business Ethics*, *27*, 321–334. https://doi.org/10.1023/A:1006226129868

Pedersen, D. M., Keithly, S., & Brady, K. (1986). Effects of an observer on conformity to handwashing norm. *Perceptual and Motor Skills*, *62*, 169–170. https://doi.org/10.2466/pms.1986.62.1.169

Pfeffer, J. (1982). Management as symbolic action: The creation and maintenance of organizational paradigms. In B. M. Staw (Ed.), *Research in organizational behavior* (Vol. 3) (pp. 1–52). JAI Press.

Ross, L., & Stillinger, C. (1991). Barriers to conflict resolution. *Negotiation Journal*, *7*, 389–404. https://doi.org/10.1111/j.1571-9979.1991.tb00634.x

Sah, R., & Stiglitz, J. (1986). The architecture of economic systems: Hierarchies and polyarchies. *American Economic Review*, *76*, 716–727. https://doi.org/10.2307/1806069

Sah, R., & Stiglitz, J. (1991). The quality of managers in centralized versus decentralized organizations. *Quarterly Journal of Economics*, *106*, 289–295. https://doi.org/10.2307/2937917

Schein, V. E. (1975). Relationships between sex role stereotypes and requisite management characteristics among female manager. *Journal of Applied Psychology*, *60*, 340–344. https://doi.org/10.1037/h0076637

Schein, V. E., Mueller, R., Lituchy, T., & Liu, J. (1996). Think manager—think male: A global phenomenon? *Journal of Organizational Behavior*, *17*, 33–41. https://doi.org/10.1002/(SICI)1099-1379(199601)17:1%3c33::AID-JOB778%3e3.0.CO;2-F

Schneider, M. R., Iseke, A., & Pull, K. (2019). The gender pay gap in European executive boards: The role of executives' pathway into the board. *The International Journal of Human Resource Management*, 1–23. https://doi.org/10.1080/09585192.2019.1620307

Seierstad, C., Warner-Sderholm, G., Torchia, M., & Huse, M. (2017). Increasing the number of women on boards: The role of actors and processes. *Journal of Business Ethics*, *141*, 289–315. https://doi.org/10.1007/s10551-015-2715-0

Sheeran, P., & Taylor, S. (2006). Predicting intentions to use condoms: A meta-analysis and comparison of the theories of reasoned action and planned behavior. *Journal of Applied Social Psychology*, *29*, 1624–1675. https://doi.org/10.1111/j.1559-1816.1999.tb02045.x

Sheridan, A., & Milgate, G. (2005). Accessing board positions: A comparison of female and male board members' views. *Corporate Governance: An International Review*, *13*, 847–855. https://doi.org/10.1111/j.1467-8683.2005.00475.x

Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *Journal of Finance*, *52*, 737–783. https://doi.org/10.1111/j.1540-6261.1997.tb04820.x

Sila, V., Gonzalez, A., & Hagendorff, J. (2016). Women on board: Does boardroom gender diversity affect firm risk? *Journal of Corporate Finance*, *36*, 26–53. https://doi.org/10.1016/j.jcorpfin.2015.10.003

Srinidhi, B., Gul, F. A., & Tsui, J. (2011). Female directors and earnings quality. *Contemporary Accounting Research*, *28*, 1610–1644. https://doi.org/10.1111/j.1911-3846.2011.01071.x

Terjesen, S., Aguilera, R. V., & Lorenz, R. (2015). Legislating a woman's seat on the board: Institutional factors driving gender quotas for boards of directors. *Journal of Business Ethics*, *128*, 233–251. https://doi.org/10.1007/s10551-014-2083-1

Terjesen, S., Sealy, R., & Singh, V. (2009). Women directors on corporate boards: A review and research agenda. *Corporate Governance: An International Review*, *17*, 320–333. https://doi.org/10.1111/j.1467-8683.2009.00742.x

Terry, D. J., Hogg, M. A., & White, K. M. (1999). The theory of planned behavior: Self-identity, social identity and group norms. *British Journal of Social Psychology*, *38*, 225–244. https://doi.org/10.1348/014466699164149

Tinsley, C. H., Wade, J. B., Main, B. G. M., & O'Reilly, C. A. (2017). Gender diversity on U.S. corporate boards: Are we running in place?

ILR Review, *70*, 160–189. https://doi.org/10.1177/0019793916668356

Van Vugt, M., & Iredale, W. (2013). Men behaving nicely: Public goods as peacock tails. *British Journal of Psychology*, *104*, 3–13. https://doi.org/10.1111/j.2044-8295.2011.02093.x

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, *36*, 157–178. https://doi.org/10.2307/41410412

Vincent, P. C., Peplau, L. A., & Hill, C. T. (1998). A longitudinal application of the theory of reasoned action to women's career behavior. *Journal of Applied Social Psychology*, *28*, 761–778. https://doi.org/10.1111/j.1559-1816.1998.tb01730.x

Weisbach, M. S. (1988). Outside directors and CEO turnover. *Journal of Financial Economics*, *20*, 431–460. https://doi.org/10.1016/0304-405X(88)90053-0

Westphal, J. D. (1999). Collaboration in the boardroom: Behavioral and performance consequences of CEO-board social ties. *Academy of Management Journal*, *42*, 7–24. https://doi.org/10.1093/oso/9780198792055.001.0001

Westphal, J. D., & Milton, L. P. (2000). Avoiding social barriers: How experience & social networks affect the influence of demographic minorities on corporate boards. *Administrative Science Quarterly*, *45*, 366–398. https://doi.org/10.2307/2667075

Westphal, J. D., & Park, S. H. (2020). *Symbolic management: Governance, strategy and institutions*. Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780198792055.001.0001

Westphal, J. D., & Zajac, E. J. (1995). Who shall govern? CEO/board power similarity and new director selection. *Administrative Science Quarterly*, *40*, 60–83. https://doi.org/10.2307/2393700

Wheeler, L. (1966). Toward a theory of behavioral contagion. *Psychological Review*, *73*, 179–192. https://doi.org/10.1037/h0023023

Xiao, J. J., Tang, C., Serido, J., & Shim, S. (2011). Antecedents and consequences of risky credit behavior among college students: Application and extension of theory of planned behavior. *Journal of Public Policy & Marketing*, *30*, 239–245. https://doi.org/10.1509/jppm.30.2.239

Yermack, D. L. (1996). Higher market valuation of companies with a small board of directors. *Journal of Financial Economics*, *40*, 185–211. https://doi.org/10.1016/0304-405X(95)00844-5

Zhang, L. (2020). An institutional approach to gender diversity and firm performance. *Organization Science*, *31*, 245–534. https://doi.org/10.1287/orsc.2019.1297

AUTHOR BIOGRAPHIES

Maria Boutchkova is a Lecturer in Finance in the University of Edinburgh Business School. Maria earned her doctorate in finance from the University of Oklahoma in 2003. Before joining the University of Edinburgh in 2012, she spent 6 years at Concordia University, Montreal, and 2 years at the University of Leicester. Maria's research focuses on corporate ownership structures, pyramidal business groups, politics and stock market volatility across the world, privatization, international corporate governance, and financial development in emerging markets. Her work has been published in top academic journals, such as the *Review of Financial Studies* and *Financial Management*.

Angelica Gonzalez is a Senior Lecturer in Finance in the University of Edinburgh Business School. Angelica holds a PhD in Economics from the University of York. Her research focuses on corporate governance with a strong emphasis on the gender diversity on boards. She has published in internationally recognized peer reviewed journals, and she is a regular speaker at international conferences. Angelica previously worked as an adviser to the Mexican Budget Commission.

Brian G. M. Main, FRSE, Academic FCIPD, is Professor of Business Economics in the University of Edinburgh Business School. Brian holds a PhD in Economics from the University of Berkeley. His research has centered on top executive pay and corporate governance, including work on tournament theory and social influence within the boardroom. He has published widely including AER, ASQ, CMR, EJ, and JMS.

Vathunyoo Sila is a Senior Lecturer in Finance at the University of Edinburgh. Vathunyoo holds a PhD in Finance from the University of Edinburgh. His research focuses on corporate governance, law and finance, and financial intermediation.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

How to cite this article: Boutchkova M, Gonzalez A, Main BGM, Sila V. Gender diversity and the spillover effects of women on boards. *Corp Govern Int Rev*. 2020;1–20. https://doi.org/10.1111/corg.12339